

LAND PLANARIANS
(Tricladida: Terricola)

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Almost each month specimens of grey to brown long flat worms with several dark stripes running down the back are submitted to the Nematology Bureau for identification and information concerning their biology. These worms are land planarians and are included in the phylum Platyhelminthes. Almost all specimens submitted belong to the genus Bipalium.

History: A land planarian (Bipalium kewense Moseley) was first described from a greenhouse at Kew Botanical Gardens near London, England, in 1878. The same species has been found commonly in American greenhouses since 1901. B. kewense is rarely encountered in our submissions.

Characterization: Land planarians are soft, bilaterally symmetric, acoelomate, dorsally-ventrally flattened worms, 3-50 cm long by 0.2-0.5 cm wide. They lack a respiratory and circulatory system, a skeleton, and an anus (5,6,9).

Heads of many land planarians are expanded lunate (fig. 2) or tapering to a blunt point. Eyespots may be present on the head. Colors of Florida species range from greenish grey to brown with dark narrow stripes on the dorsal side. Some of the exotic species (fig. 3) are brightly colored gold and black. A mouth, which also serves as an anus, is present near mid-body on the ventral surface. A protusible muscular plicate pharynx serves as a feeding organ and is attached to a three-branched intestine. The space between organs is filled with parenchyma. Circular and longitudinal muscles are present. A cerebral ganglia serves as a brain, innervating a ladder-shaped nervous system. Excretion of fluid wastes is accomplished with a primitive proto-nephridial system.

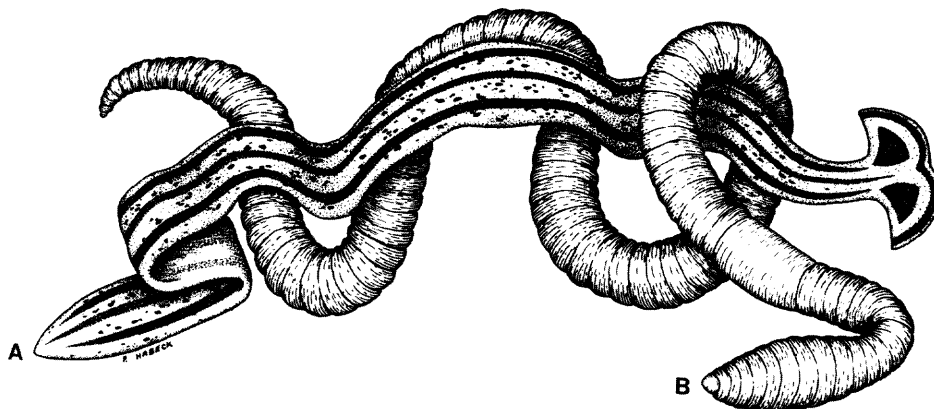


Figure 1. A land planarian (A) attacking an earthworm (B).

Economic Importance: Land planarians occasionally invade breeding beds in commercial earthworm farms and severely deplete the earthworm population (4). In greenhouses, where some collectors believe they might damage plants, they are considered harmless.

Geographic Distribution: Land planarians thrive in high temperatures and humidities, thus they are widely distributed in tropical and subtropical areas. They have been detected in natural habitats in Florida and Louisiana. They have been reported in greenhouses in Alabama, California, Georgia, Illinois, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Ohio, and Oklahoma (3,7). Land planarians have not been detected west of the Mississippi River in mountain or desert areas.

The widespread occurrence of land planarians is a result of horticultural practices and dispersion of potted plants in commerce. In tropical and subtropical areas, once established in a greenhouse, they disperse to the adjacent environment.

Habitat: Because land planarians are photonegative during daylight hours and require high humidities, they are found in dark, cool, moist areas under objects such as rocks, logs, man-made materials, in debris, or under shrubs, and on the soil surface following heavy rains. Land planarians are also found in caves but are rare in rural sites. Movement and feeding occur at night. High humidity is essential to survival. They can survive desiccation only if water loss does not exceed 45% of their body weight (6). Land planarians are most abundant in spring and fall (3).

Locomotion: Land planarians glide smoothly on the substrate by the action of powerful, closely spaced cilia in a special medial ventral strip (creeping sole), on a thin coat of mucus secreted on the substrate by cyanophilous glands opening into the creeping sole. Land planarians that migrate on plants or objects above the ground, sometimes regain the ground by lowering themselves down by a string of mucus (1).

Nutrition: Land planarians devour earthworms, slugs, insect larvae, and are cannibalistic. Prey are located by chemoreceptors located in a single ciliated pit under the head or in a ciliated ventral groove. Struggling prey are held to the substrate (fig. 1) and entangled in slimy secretions from the planarian. The pharynx is protruded from the mouth and into the prey. Food is reduced to small particles prior to entering the gastrovascular cavity. The food particles are taken by epithelial cells in amoeboid fashion and

formed into food vacuoles (8). Planaria store food in digestive epithelium and can survive many weeks shrinking slowly in size without feeding. They are capable of utilizing their own tissues such as reproductive tissue for food when reserves are exhausted.

Reproduction and Development: Reproduction is principally by fragmentation at the posterior end. Lateral margins pinch in about 1 cm from the tail tip. Severance occurs when the posterior fragment adheres to the substrate and the parent worm pulls away. The posterior fragment is motile immediately, and within 7-10 days a lightly pigmented head begins to form. One to two fragments are released each month (2).

Eggs are deposited in 0.6-9.7 cm cocoons that are bright red when deposited. Within 24 hr the cocoons turn black. Planarians emerged in approximately 21 days (2).

Planarian Enemies: Land planarians are rarely devoured by other animals, since surface secretions appear distasteful, if not toxic. Protozoans, including flagellates, ciliates, sporozoans, and nematodes have been detected in land planarians (5). Because of their cannibalistic habit, land planarians may be their own worst enemy.

Survey and Detection: In daylight look for flat worms with expanded head under rocks, logs, and man-made materials only where cool damp areas exist. Slime trails are tell-tale evidence of land planarians but might also indicate slugs or snails.

In worm beds, look for land planarians attached to earthworms by mucus membranes. Collected specimens rarely survive when sent alive to Gainesville via bus or mail. Specimens should be placed in a vial of 70% alcohol or 4% formaldehyde.

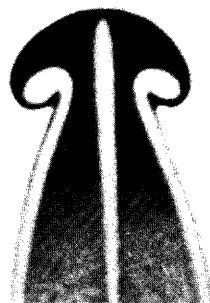


Figure 2. Bipalium voighti head after von Graf.

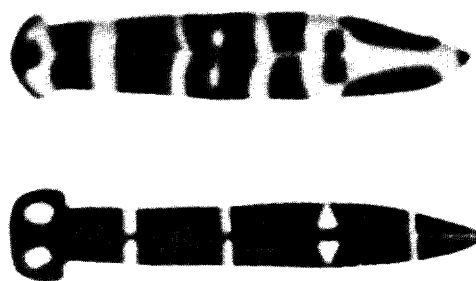


Figure 3. Exotic land planaria. Top: B. rauchi; bottom: B. quadricinctum after von Graf.

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